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ABSTRACT

In an attempt to determine whether knowledge of teachers' conceptual systems can be used to predict teaching styles in handling information and applying sanctions, the teaching styles of 136 home economics student teachers from three midwestern universities were measured by coding tape-recorded lessons according to Joyce's system, and two measurements of their conceptual system were made using Schroder's Paragraph Completion Test and Harvey's Conceptual Systems Test. Statistical analysis of the relationship between conceptual system and teaching style yielded no significant differences using Schroder's Paragraph Completion Test. With Harvey's Conceptual Systems Test significant differences were found. As the abstractness of the teacher's conceptual structure increased, a reflective teaching style, characterized by more sanctioning of search behavior, more handling of information by helping students theorize and express themselves, and less questioning for precise answers and sanctioning attainment, was used more often. Research results indicate that if a reflective teaching style is desired by educators, then teacher trainees whose conceptual systems are at lower stages of development must either be taught to use a reflective teaching style or be helped to develop a more abstract conceptual structure. (Author/RT)

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CONCEPTUAL SYSTEMS AND TEACHING STYLES

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Studies of classroom interaction show that teachers spend about two-thirds of their class time on two kinds of communications: handling of information and bestowing of rewards and punishments (Bellack and Davitz, 1963; Flanders, 1963). Information can be handled in different ways and sanctions applied to different student behaviors. A system for analysis of the teacher's verbal communications developed by Joyce (1967) identifies four ways of handling information and five categories of applying sanctions. The teacher can tell or deliver information to students; she may summarize, give conclusions or express her views or opinions; she may ask narrow questions to elicit specific information from students; or she may require the student to draw conclusions, to hypothesize, or to express his ideas. In applying sanctions, the teacher may sanction the student's search for a solution to a problem; reward the correct answer itself; sanction the student's ability to conform to rules and directions; or reward his relations with others in the classroom. Characteristic ways of handling information and of applying sanctions are defined as teaching styles.

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In 1967 Hunt and Joyce reported a statistically significant correlation between occurrence of a reflective teaching style and the teacher's conceptual system. Conceptual system appears to be a useful variable for predicting teaching styles.

THEORETICAL FRAMEWORK

According to Harvey, Hunt, and Schroder (1961), a conceptual system represents a structure or organization of concepts which operate together producing characteristic conceptual functioning. They postulate four stages in conceptual development fron concreteness to abstractness, each stage representing a conceptual system different from the others. Drawing upon their theoretical description of conceptual systems it was hypothesized that teachers characterized by different conceptual systems would exhibit different teaching patterns.

Teachers characterized by unilateral dependence (System 1) see themselves, other status persons, or the textbook as authority sources and regard what is stated by these authorities as the highest good. Searching or seeking for unknowns by students is regarded as inappropriate and unnecessary for learning; one does not seek his own answers in defiance of authority. Questions have only one answer which is "right" according to the authority source. Teachers who function at this level will tend to deliver

information to pupils and ask narrow questions permitting only one "right" answer. They will reward the student's ability to state definitions, facts, or bits of information as given by the authoritative source, and also reward the student's ability to conform to teacher-established procedures, directions, and rules.

Teachers characterized by negative independence (System 2) tend to reject the customary social roots for self-definition and esteem. They lack stable referents for their concepts which creates inconsistency and uncertainty in their functioning. These teachers use criteria for judging adequacy of performance that are often inconsistent or impulsive and are inconsistently imposed. Teachers functioning at this level will tend to deliver information to students, to ask narrow questions, and to reward conformity to rules in much the same manner as those whose system is unilaterally dependent except that they are erratic and unpredictable in their expectations of students.

Teachers characterized by conditional dependence (System 3) have high affiliative needs and are very susceptible to group influences. They are concerned with establishing friendships, intragroup concensus, and dependency relations but their dependence is based on mutuality rather than on authority and rules. Since they are more abstract than those described above, these teachers will encourage pupils to express themselves and to

theorize. They will not deliver information and ask narrow questions as much as the unilaterally dependent teacher and will reward searching by pupils and do less sanctioning of attainment and obedience to rules. However, they will sanction pupil relations with others more than teachers functioning at other conceptual levels. They will also make more general supportive comments in the classroom.

Informationally interdependent teachers (System 4) have abstract conceptual structures and are cognitively complex. These teachers do not see themselves as an authority source for pupils. They regard knowledge as tentative rather than absolute; they have a respect for doubt, an openness to new experience, and can consider situations from the pupil's point of view. Rules or standards are presented informationally rather than through arbitrary and external imposition. The informationally interdependent teacher will encourage pupils to test, relate, and reflect upon their own ideas and to hypothesize, synthesize, and even conjecture about content. She will ask questions to aid in the search for understanding and for relationships rather than for precise, "correct" answers. She will reward the seeking by pupils more than the finding of solutions.

Summary of Hypotheses

1. As the abstractness of the teacher's conceptual system increases the proportion of information handled by delivering information and by questioning students for precise answers decreases and the proportion of information handled by helping students theorize and express themselves increases.

2. As the abstractness of the teacher's conceptual system increases the proportion of the teacher's sanctioning of attainment and conformity decreases while her sanctioning of search behavior increases.

3. Proportionately more group relations behaviors will be sanctioned and more general support offered by teachers characterized by conditional dependence than by teachers characterized by other conceptual systems.

METHOD

Subjects

The subjects were 136 student teachers in home economics from three midwestern universities. All subjects were females and were at similar stages of professional preparation.

Assessment of Conceptual System

Prior to student teaching, two instruments measuring conceptual system were administered. The first, Harvey's Conceptual Systems Test (1967) consists of 67 statements of belief to which the respondent indicates the strength of agreement or disagree-

ment on a six-point scale. Six factors are identified through scores on the instrument: Divine Fate Control, Need for Structure-Order, Need to Help People, Need for People, Interpersonal Aggression, and Anomie. The cutting points for analysis of the score profiles developed by Harvey (1968) are shown in Table 1.

Table 1
Cutting Points for Conceptual Systems Test

System	Divine Fate Control	Interpersonal Aggression	Anomie	Need for People	Need for Structure
Unilateral Dependence	> 4.19				
Negative Independence	≤ 4.19	> 3.75	>3.39		
Conditional Dependence	≤ 4.19	≤ 3.75		> 4.10	
Informational Interdependence	≤ 4.19	≤ 3.75		≤ 4.10	≤ 4.10

Seventy-six of the 136 subjects scored as System 1 (55.9%), 21 as System 3 (15.5%), and 12 as System 4 (8.8%) with the remainder scoring as "admixtures" (19.8%). There were no System 2 subjects. For purposes of testing the hypotheses, 32 of the subjects scoring as System 1 were randomly chosen to comprise the sample together with all the System 3 and System 4 subjects and the 3-1 and 1-3 Admixtures.

Schroder's Paragraph Completion Test (1967) was the second instrument used to measure conceptual system. This instrument consists of five incomplete sentence stems which the subject completes by writing a three or four sentence paragraph. The stems have been selected to assess the abstractness of conceptual structure in regard to interpersonal stimuli. The completed responses are analyzed for structural characteristics and scored representing low to high levels of integrative complexity. On the basis of the sum of the top two scores, scores of four or below are adjudged to be indicative of individuals functioning at the lower or concrete end of the scale. Scores of seven or above are considered indicative of individuals functioning at the higher or more abstract end of the scale. In this investigation the responses were scored by a trained scorer in the office of the test-developer.

Table 2 reports the distribution of the subjects in this study when Schroder's Paragraph Completion test was used as the measure of conceptual system.

Assessment of Teaching Style

During the student teaching period each subject made audio-tape recordings of three lessons. A twenty-minute segment was randomly selected from each subject's tape and coded for information-handling and applying sanctions according to Joyce's

Table 2

Distribution of Scores on Schroder's PCT
(N=136)

Sum of Top Two Scores	f
2	1
3	12
4	45
5	37
6	19
7	4
8	2
unscorable	16
Total	136

Manual for Analyzing the Oral Communications of Teacher (Joyce and Harootunian, 1967). Instances of handling information were categorized as: helping students theorize, helping students toward self-expression, questioning students for precise answers, and delivering information. Each occurrence of applying sanctions was coded as: sanctioning search behavior, sanctioning group relations, sanctioning attainment, sanctioning conformity to rules, and offering general support. For each subject, a proportion was computed for each sub-category of handling information in relation to the subject's total number of instances of handling information; the proportion for each sub-category of sanctions was similarly computed.

RESULTS

Teaching Styles

Four teaching styles were identified from the tape recordings: lecturing, recitation, amplified recitation, and reflective (see Table 3).

Table 3

Occurrence of Teaching Styles by Systems

System	N	Lecturing		Recitation		Amplified Recitation		Reflective		Other	
		f	%	f	%	f	%	f	%	f	%
1	32	15	46.9	5	15.6	12	27.5	0	0	0	0
3	42	10	23.8	5	11.9	9	21.4	12	28.6	6	14.3
4	12	3	25.0	1	3.1	1	3.1	7	58.3	0	0

Lecturing style represented scores greater than 60 per cent on "delivering information" and more unilaterally dependent teachers exhibited this style than any other teachers.

The recitation style consisted of a narrow question asked by the teacher, followed by a single word or a short phrase response by the pupil. The pupil's response then elicited a sanctioning attainment response from the teacher which was

usually a single word as "good," or "okay," or a phrase, such as "that's right," Then the cycle began with another narrow question. Recitation style was defined as scores greater than 60 per cent on "asking narrow questions." This style was accompanied by very high scores on "sanctioning attainment" (88 to 98 per cent).

A third pattern found in the recorded lessons consisted of the teacher asking a narrow question, followed by a pupil's short response which elicited an attainment sanction. This was followed by the teacher delivering a few comments and asking another question to start the cycle again. This style can be termed an "amplified recitation" for the teacher's comments clarified or expanded the pupil's response. In some cases, she also delivered information relative to the next question to be asked. This style was defined as scores of 50 per cent ± 5 per cent on "questioning students for precise answers" and "delivering information." High scores on "sanctioning attainment" were also found with this style.

Reflective teaching was defined as scores of 10 per cent or more on "helping students theorize" or "helping students toward self-expression." This style was accompanied by higher scores on "sanctioning search behavior" than any other teaching style.

Tests of Hypotheses

One-way analysis of variance tests and Newman-Keuls Test on Ordered Means were used to determine whether the differences among the systems with respect to teaching styles were statistically significant ($p < .01$). Table 4 summarizes the tests of the hypotheses when Harvey's Conceptual Systems Test was used to identify conceptual system. Statistically significant relationships were found between conceptual system and handling information by "helping students theorize," "helping students toward self-expression," and "questioning students for precise answers," but not for "delivering information." Teachers characterized by more abstract conceptual systems did proportionately more handling of information by "helping students theorize" and by "helping students toward self-expression" while teachers characterized by more concrete conceptual systems did proportionately more handling information by "questioning students for precise answers."

Statistically significant relationships were also found between conceptual system and sanctioning "search behavior," "group relations," and "attainment," but not for "offering general support." Teachers of more abstract systems did proportionately more sanctioning of search behavior than did teachers of more concrete conceptual systems. Teachers characterized by conditional dependence did significantly more sanctioning of

Table 4
Summary of Analysis of Variance Tests and Tests on Ordered Means
Harvey's Conceptual Systems Test As Measure of Conceptual System

Teaching Variable	System Mean Scores 1	3	4	F Value	Differences in Means 1-3	1-4	3-4
Handling Information:							
Helping students theorize	.002	.032	.072	10.8**	*	**	**
Helping students toward self-expression	.002	.075	.121	16.4**	**	**	*
Questioning for precise answers	.426	.355	.259	5.0**		*	
Delivering information	.561	.495	.500	1.4			
Applying Sanctions:							
Sanctioning search behavior	.012	.191	.423	16.1**	**	**	**
Sanctioning group relations	.000	.046	.015	7.2**	*		
Sanctioning attainment	.885	.694	.503	12.9**	**	**	**
Sanctioning conformity to rules	.093	.043	.046	1.5			
Offering general support	.008	.025	.011	2.1			

* $p < .05$
** $p < .01$

group relations than teachers of any other conceptual system. The more concrete teachers did significantly more sanctioning of attainment behaviors than did teachers of the more abstract conceptual systems.

When Schroder's Paragraph Completion Test was used as the measure of conceptual system, no statistically significant results were obtained.

DISCUSSION

It could tentatively be concluded that conceptual system (as measured by Harvey's Conceptual Systems Test) influences teaching style. Informationally interdependent teachers handle information and apply sanctions differently from conditionally dependent or unilaterally dependent teachers.

Which teaching style is most desired depends in part upon the characteristics desired in learners. For example, if exploratory behavior by pupils is valued, less delivering of information and sanctioning of attainment with more helping students theorize and sanctioning of search behavior by teachers are necessary.

Teachers characterized by more abstract conceptual structures

did exhibit more reflective teaching behaviors. From this it would seem that efforts to increase the abstractness of the teacher's conceptual system might also result in her ability to exhibit more reflective teaching behaviors.

Among educators are those who believe that the goal of education is to produce persons who are inventive, original, critical and adaptive in directing and meeting change. If such a goal is accepted, if certain teaching styles are more conducive to conceptual growth and development toward such qualities, and if conceptual system is useful in predicting the teaching style of teachers (as it appears to be), then certain questions concerning the professional preparation of teachers need to be investigated. Can trainees for teaching whose conceptual systems are at lower stages of development be taught to use a reflective teaching style in classroom teaching performance? If they can be so trained, what conditions are sufficient to effect the results? Is exposing the trainee to the processes and principles of reflective and adaptable teaching enough? Or, is it necessary to provide conditions for the trainee to develop a more abstract conceptual structure before he will use the principles and processes of reflective teaching?

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